

In the Claims

Please cancel non-elected Claims 19-32.

Remarks

✓ Per the Examiner's request, Applicant is (1) hereby amending the title to be more descriptive of the elected claims, which are drawn to a method of delivering and releasing active material; and (2) canceling non-elected Claims 19-32, while reserving the right to file a divisional application containing these claims at a later date.

Rejection Under 35 U.S.C. Section 103

Claims 1-8, 10, and 12 -18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Akashi et al. (U.S. Patent No. 5,686,385). The rejection is respectfully traversed for the following reasons.

Akashi et al. address the problem of decomposition of agricultural active ingredients by microencapsulating the active ingredients with water-soluble materials (see, for example, column 3, line 59, through column 4, line 3). The microcapsules are prepared by (1) preparing an aqueous solution, suspension, or emulsion of the active ingredient and water-soluble coating material, and (2) drying the resulting solution, suspension, or emulsion by suction drying or spray drying (see, for example, column 8, line 12, through column 9, line 12). The resulting product thus appears to be a dry powder that is said to have excellent storage stability and to be easy to handle (see, for example, column 12, lines 27-56).

The Examiner has noted that the Akashi microcapsules can be used as a "water-dispersible powder" and has asserted that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to deliver a dispersion of alginate microcapsules containing pheromones to achieve the beneficial effect of handling and improving physical properties in view of Akashi et al." Applicant respectfully submits, however, that the microcapsules of Akashi are actually quite different from Applicant's microbeads and, furthermore, that Akashi actually teaches away from the instant invention for the following reasons.

The Examiner has overlooked the fact that Applicant's claims recite the term "hydrogel." Applicant's method involves the use of a suspension of microbeads that are

prepared in a manner that provides hydrogel (or water-containing gel) microbeads. Such microbeads comprise a three-dimensional polymeric network that can imbibe water without the loss of shape and mechanical strength (see the enclosed copy of a description of hydrogels from the Encyclopedia of Polymer Science and Engineering, Volume 7, page 783, John Wiley & Sons, New York (1987)). As explained, for example, at page 15 of Applicant's specification, Applicant's preparation process includes a hardening or curing step that involves the use of chemical or non-chemical means to form chemical or physical polymer crosslinks.

The resulting hydrogel microbeads "swell" under humid conditions and shrink under dry conditions, and Applicant has discovered that this characteristic can be used to control the release of active material from the microbead. As explained at page 3, lines 1-4, of Applicant's specification, "the microbeads are capable of re-hydrating after an initial dehydration and release of active. Thus, the release and longevity of the active can be controlled by adjusting the humidity of the environment in which the microbeads have been delivered."

In contrast, Akashi does not appear to teach or suggest a hardening or curing step, but rather teaches a drying step that is used to remove water and form a dry powder. The Examiner is correct that the resulting powder is said to be dispersible in water, but, due to the absence of a three-dimensional polymeric network, it would tend to at least partially dissolve and, after application to a field, would not cyclically dehydrate and rehydrate without loss of shape or mechanical strength.

Furthermore, Akashi actually teaches away from hydrogel formation by stating, for example, that "[g]enerally, the exit-temperature [of the spray-dryer] should be not less than 100°C in order to avoid an adverse effect in that residual water in the obtained microcapsules may have a bad influence on stability of an active ingredient" (see column 9, lines 9-13). This statement hardly suggests to one skilled in the art that a water-containing gel would be advantageous. Applicant therefore respectfully submits that the instant claims are indeed unobvious and patentable over Akashi and respectfully requests that the rejection under Section 103 be withdrawn.

Appl. did not claim this step

The judicial argument is standard.

See Column 9, lines 3-4

Obviousness-Type Double Patenting Rejection

Claims 1-8 and 10-18 were provisionally rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-50 of copending Application No. 09/426,140. This rejection is respectfully traversed for the following reasons.

Enclosed with Applicant's previous amendment (filed on October 5, 2001), without prejudice, was a "Terminal Disclaimer Under 37 C.F.R. Section 1.321(b)," which disclaimed the portion of the term of any patent granted on the instant application that would extend beyond the expiration date of the term of any patent granted on pending second application USSN 09/426,140 or of any patent granted on pending third application USSN 09/425,761. The Disclaimer also indicated that the instant application and the pending second and third applications are commonly owned by 3M Innovative Properties Company by virtue of assignments recorded at Reel 010344, Frame 0332, on October 22, 1999; Reel 010341, Frame 0737, on October 22, 1999; and Reel 010343, Frame 0770, on October 22, 1999. The Disclaimer further indicated that the chain of title of the instant application has been examined in order to comply with 37 C.F.R. Section 3.73(b).

Since under 37 C.F.R. Section 1.130(b) a terminal disclaimer in compliance with 37 C.F.R. Section 1.321(c) can be used to overcome a non-statutory double patenting rejection, Applicant respectfully requests that the double patenting rejection be withdrawn.

Non-Elected Claims

As indicated above, non-elected Claims 19-32 (drawn to a sprayable composition) have been canceled, with reservation of the right to file a divisional application containing these claims at a later date. Claim 9 has not been canceled, pending the Examiner's determination as to whether the species of Claim 9 are embraced by an allowable generic claim.


Concluding Remarks

For the foregoing reasons, Applicant's claims are believed to be in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

February 5, 2002

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Amendments

In the Specification

On page 1, please delete the title and replace it with the following:

--METHOD OF DELIVERING ACTIVE MATERIAL WITHIN HYDROGEL
MICROBEADS--.

In the Claims

Please cancel non-elected Claims 19-32.